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5514	7590	03/24/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			YAMNITZKY, MARIE ROSE	
			ART UNIT	PAPER NUMBER
			1774	

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,012

Applicant(s)

KAMATANI ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/26/03, 11/26/03 & 12/22/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,8-41 and 43-47 is/are pending in the application.
- 4a) Of the above claim(s) 3,16-20,22 and 37-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,8-15,21,23-36,41 and 43-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No.(s)/Mail Date rec'd 08/26/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

1. This Office action is in response to applicants' amendment received December 22, 2003, which amends the specification, cancels claims 2, 4-7 and 42, and amends claims 1, 8-10, 12-15, 23, 35, 36, 41, 43 and 44.

Claims 1, 3, 8-41 and 43-47 are pending.

2. The claims remain subject to an election of species requirement. Applicants previously provisionally elected the species in which the metal coordination compound is a compound of formula (3) in which M is Ir, m is 3, n is 0, A of partial structure ML_m is Ph and B is Iq_2 . In applicants' response received December 22, 2003, applicants affirm their prior provisional election and do not traverse the requirement.

The examiner notes that present independent claims 1 and 41 and claims dependent therefrom do not read on the elected species because these claims do not encompass compounds of formula (3) in which n is 0.

Present independent claim 23 and some of the claims dependent therefrom questionably read on the elected species given the conflicting requirements set forth in claim 23. Claim 23 presently requires a compound that meets the limitations of formula (3) and formula (8), but formulae (3) and (8) as defined in claim 23 define mutually exclusive subsets of compounds. Compounds that meet formula (8) as defined in claim 23 read on the elected species while compounds that meet formula (3) as defined in claim 23 do not read on the elected species.

Although they no longer (or questionably) read on the elected species, the examiner will continue examination of claims 1, 8-15, 21, 23-36, 41 and 43-47, but this action should not be taken as a examination on the merits of all species encompassed by the claims.

Claims 3, 16-20, 22 and 37-40 stand withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim. Election was affirmed **without** traverse in the response received December 22, 2003.

With respect to applicants' comments regarding generic claims, the examiner notes that none of the present claims are generic. For example, claim 3 is drawn to a species non-elected without traverse and, while dependent from claim 1, is not within the scope of claim 1 as currently amended.

3. Applicants' amendment overcomes part of the objection to the disclosure as set forth in the Office action mailed June 18, 2003. The examiner agrees that "4-trifluoromethyloxyphenyl" is supported by Ex. No. 273. (The examiner notes that the structure shown on page 27 of applicants' response contains an error in that the trifluoromethyloxy substituent should be shown with the oxygen attached to the phenyl ring rather than the carbon.) Remaining issues are set forth in this Office action.

Applicants' amendment overcomes some of the issues raised under 35 U.S.C. 112, 2nd paragraph, in the Office action mailed June 18, 2003. Remaining issues and new issues raised by applicants' amendment are set forth in this Office action.

Applicants' amendment overcomes the rejections under 35 U.S.C. 102(e) based on the published application of Igarashi et al. (US 2001/0019782 A1) and the published application of Kwong et al. (US 2003/0072964 A1).

4. The disclosure stands objected to because of the following informalities:

The scope of a "1-(3,4,5,6-tetrafluoromethyl)phenyl group" (recited, e.g., at p. 16, l. 25-26) and a "3,4,5,6,7,8-hexafluoro group" (recited, e.g., at p. 17, l. 1) is not clear.

Appropriate correction is required.

5. Claims 23-35, 43 and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of compounds encompassed by claim 23, with claims 24-35 dependent therefrom, is not clear because the requirement that the compound have a partial structure ML represented by formula (8) conflicts with the requirement that the compound be represented by formula (3). A compound having a partial structure ML represented by formula (8) as defined in claim 23 does not meet the limitations of a compound represented by formula (3) as defined in claim 23.

It is not clear what is meant by "non-neighboring methylene group" as recited in the definition of formula (8) in claims 23 and 43. What is the methylene group "non-neighboring" to?

It is not clear what a "1-(3,4,5,6-tetrafluoromethyl)phenyl group" is as required by claim 32. A methyl group does not have positions identifiable as 3, 4, 5 or 6, and a methyl group cannot be substituted by four fluorine atoms and at the same time be bonded to a phenyl group.

It is not clear what is meant by a "3,4,5,6,7,8-hexafluoro group" as required by claim 32. It is not clear if this requires six hydrogen atoms of the isoquinolyl group to be substituted by fluorine atoms, or if the six fluorine atoms are part of an unspecified substituent on the isoquinolyl group.

Claim 43, with claim 47 dependent therefrom, is confusing because claim 43 depends from claim 41 and requires the organic compound as defined in claim 41 to comprise a compound having a partial structure ML represented by formula (8). However, claim 41 requires that the compound be represented by formula (3). A compound having a partial structure ML represented by formula (8) as defined in claim 43 does not meet the limitations of a compound represented by formula (3) as defined in claim 41.

The limitations of claim 47 are also not clear as dependent from cancelled claim 42.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 8-15, 21, 23-36, 41 and 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US 2001/0019782 A1).

Igarashi et al. disclose metal coordination compounds for use as light emitting materials in organic electroluminescent devices (e.g. see paragraph [0002]). Igarashi et al. suggest metal coordination compounds having a partial structure represented by present formula (1) which is further represented by present formula (2) in which M is iridium, wherein the compound is represented by present formula (3) or present formula (8).

Igarashi's compounds of formulae (1-56) and (1-59), for example, meet the limitations of a compound of present formula (3) with the exception that the prior art compounds do not contain a substituent on the group corresponding to A or B of present formula (2). The compound of formula (1-56) contains A and A' groups as further defined by claims 8-11 and 15, and B and B' groups as further defined by claims 12, 13 and 15, with the exception of the required substituent on A or B. The compound of formula (1-59) contains A and A' groups as further defined by claims 8, 9 and 15, A' groups as further defined by claims 10 and 11, and B and B' groups as further defined by claims 12, 13 and 15, with the exception of the required substituent on A or B.

Igarashi's compound of formula (1-56), which is the same as compound 31 disclosed in the present specification, is red-luminescent. See Igarashi's Example 27 (paragraph [0185]).

With respect to compounds represented by formula (8) as defined in claim 23, with claims 24-35 dependent therefrom, and in claim 43, Igarashi's specific iridium compounds include compounds in which all three ligands are the same (as in Igarashi's compound of

formula (1-60)), compounds containing one or more phenylisoquinoline ligands (as in Igarashi's compound of formula (1-56)), and compounds containing fluorinated substituents (as in Igarashi's compound of formula (1-61)).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make other compounds within the scope of Igarashi's generic formulae and similar to the specific compounds disclosed by Igarashi et al. with the expectation that similar compounds would have similar properties and could be used for the purposes of the prior art.

One of ordinary skill in the art at the time of the invention would have reasonably expected that compounds similar, for example, to compounds of formulae (1-56), (1-59) or (1-60) having substituents on the isoquinoline or the phenyl or naphthyl group of the isoquinoline-containing ligand would be light-emissive compounds suitable for use in organic electroluminescent devices since Igarashi et al. clearly teach that the aromatic groups of the ligands may be substituted.

One of ordinary skill in the art at the time of the invention would have reasonably expected that compounds having three isoquinoline-containing ligands wherein at least one, but not all, of the ligands contained a substituent as required, for example, by present claim 14, would be light-emissive compounds suitable for use in organic electroluminescent devices since Igarashi et al. teach isoquinoline-containing ligands, teach substitution of the ligands, and teach that the ligands need not be identical.

With respect to the use of ligands having fluorine or fluorinated substituents, one of ordinary skill in the art would have reasonably expected an iridium compound having one, two

or three phenylisoquinoline ligands which were substituted with fluorine and/or fluorinated substituents to be suitable for Igarashi's purposes since Igarashi et al. teach that the ligands of the iridium compounds may be substituted with fluorine and/or fluorinated substituents (e.g. see paragraph [0050]).]

8. Claims 1, 8-15, 21, 23-36, 41 and 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwong et al. (US 2003/0072964 A1).

Kwong's compound of formula III as defined, for example, in claims 1 and 68 of Kwong's published application encompasses compounds having a partial structure represented by present formula (1) which is further represented by present formula (2), wherein the compound is represented by present formula (3) or present formula (8). Kwong's compounds are disclosed for use as an emissive material in an organic electroluminescent device. As defined in Kwong's claims 1 and 68, the phenyl and/or the isoquinoline group of the phenylisoquinoline ligand(s) may be substituted. In addition to one or more phenylisoquinoline ligands, Kwong's compound of formula III may comprise another bidentate ligand. The formulae set forth in Kwong's claim 17 provide various ligands that provide a partial structure ML'_n represented by present formula (4). For example, the first formula set forth in Kwong's claim 17 provides a phenylpyridine ligand.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make various compounds within the scope of Kwong's compound of formula III in order to provide various compounds other than those explicitly disclosed by Kwong et al. for

Art Unit: 1774

use in an organic electroluminescent device. One of ordinary skill in the art at the time of the invention would have reasonably expected that compounds within the scope of Kwong's compound of formula III having substituents selected from those suggested by Kwong et al. would have properties similar to those of the specific compounds disclosed by Kwong et al. and would be suitable for use in an organic electroluminescent device as taught by Kwong et al.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

9. Applicants' arguments filed December 22, 2003 have been fully considered but they are not persuasive.

With respect to claim 23, the change from "non-adjacent" to "non-neighboring" in the definition of formula (8) does not clarify the claim limitations.

With respect to the scope of a "1-(3,4,5,6-tetrafluoromethyl)phenyl group" and a "3,4,5,6,7,8-hexafluoro group", applicants set forth two formulae on page 26 of applicants' response, one said to represent the 1-(3,4,5,6-tetrafluoromethyl)phenyl group and one said to represent the 3,4,5,6,7,8-hexafluoro group.

The formula said to represent the 1-(3,4,5,6-tetrafluoromethyl)phenyl group does not contain any methyl groups or any fluorine substituted methyl groups. The terminology "3,4,5,6-tetrafluoromethyl" requires a methyl group having four fluorine substituents at positions 3, 4, 5 and 6, but a methyl group has only three hydrogens which can be substituted by fluorines, and

does not have the multiple carbons implied by “3, 4, 5 and 6”. Accordingly, the questions raised in the objection to the disclosure and the rejection under 35 U.S.C. 112, 2nd paragraph, with respect to this group remain. (The first formula shown on page 26 of applicants’ response could be named as 1-(3,4,5,6-tetrafluorophenyl).)

A “3,4,5,6,7,8-hexafluoro group” as recited at p. 17, l. 1 of the specification is disclosed as a possible substituent at the 4- or 5- position of the isoquinoline group in the partial structure represented by formula (8). The second formula shown on page 26 of applicants’ response does not depict an isoquinoline group substituted at the 4- or 5-position with a substituent comprising six fluorines. Accordingly, the questions raised in the objection to the disclosure and the rejection under 35 U.S.C. 112, 2nd paragraph, with respect to this group remain.

With respect to the rejection based on Igarashi’s published application, applicants argue that Igarashi teaches away from having substituents and that none of Igarashi’s specific compounds meet the limitations of the present claims. Applicants argue that in order to provide a compound of the present invention based on Igarashi’s disclosure, one would have to chose two different bidentate ligands, choose to have at least one of substituents R¹¹ and R¹², and choose one of R¹¹ and R¹² to be one of the present claimed substituents. Applicants argue that a prima facie case of obviousness cannot be made because the motivation to assemble the presently claimed structure is absent in view of Igarashi’s teaching away from the present invention.

The examiner respectfully disagrees. Igarashi clearly teaches that the iridium compounds may have two different bidentate ligands. Igarashi clearly teaches that the ligands may have

Art Unit: 1774

substituents and discloses substituents meeting the limitations of the at least one substituent required by the present claims. While Igarashi does not disclose a specific compound meeting the limitations of the present claims, Igarashi discloses specific compounds that are similar in chemical structure to the compounds of the present claims as set forth in the rejection. There is no evidence of record in the present application to demonstrate that the compounds required by the present claims provide superior/unexpected results compared to the closest prior art. The tables on pages 40-76 of the specification define various compounds, some of which meet the limitations of the present claims and some of which do not. However, none of the exemplary electroluminescent devices described in the specification utilize a compound having two different bidentate ligands in which at least one of the ligands contains a substituent as required by the present claims. Absent a showing of superior/unexpected results commensurate in scope with the rejected claims, it is the examiner's position that the rejected claims are *prima facie* obvious in view of Igarashi's disclosure of compounds that are similar in chemical structure and taught for the same use as the present compounds.

With respect to the rejection based on Kwong's published application, applicants argue that the phenyl group and isoquinolyl group of Kwong's compounds need not be substituted. Applicants also argue that there are hundreds of possible substituents disclosed in paragraph [0011] that are outside the scope of the present claims, and the second ligand need not be a bidentate ligand. Applicants argue that in order to provide a compound of the present invention based on Kwong's disclosure, one would have to choose to have a second bidentate ligand, choose the second bidentate ligand to have two cyclic groups with one cyclic group bonded to

Art Unit: 1774

the metal through nitrogen and the other bonded to the metal through carbon, choose at least one of R^1 to R^{10} to be one of the presently claimed substituents by “ignoring an overwhelming amount of substituents, which are outside the scope of the present claims.” Applicants argue that Kwong teaches away from the present compounds such as by only disclosing specific compounds in which the second bidentate ligand does not meet the limitations of the present claims. Applicants argue that a prima facie case of obviousness cannot be made because the motivation to make the argued choices is absent.

The examiner respectfully disagrees for reasons similar to those set forth with respect to Igarashi's published application. Kwong clearly teaches that the compounds may have two different bidentate ligands, discloses several bidentate ligands that meet the limitations of L' of the present claims, clearly teaches that the ligands may have substituents, and discloses substituents meeting the limitations of the at least one substituent required by the present claims. With respect to applicants' argument that Kwong's disclosed substituents include hundreds of possible substituents that are outside the scope of the claims, the present independent claims allow the substituent for A and/or B to be selected from a list of possible substituents that encompasses hundreds, if not thousands, of different substituents, all of which appear to be within the scope of Kwong's disclosed substituents. There is no evidence of record to demonstrate that the very large group of substituents encompassed by the present claims, which is a subset of Kwong's disclosed substituents, provides unexpected/superior results.

10. Miscellaneous:

In the fourteenth line after formula (2) in claims 1, 23 and 41, the examiner suggests deleting “and” because a “trialkylsilyl group” is not the last possibility set forth for the substituent of the cyclic groups A and B.

In claims 1, 23 and 41, “m” of formula (3) is defined as 1, 2 or 3, “n” is defined as 1 or 2, and there is a proviso that $m+n$ is 2 or 3. Since “n” must be 1 or 2, the examiner notes that “m” must be 1 or 2 in order for the proviso regarding $m+n$ to be met.

Various occurrences of “nitro atom” should be changed to --nitro group-- since “nitro” is a group rather than an atom.

In the penultimate line of claim 8, “rip” should be deleted. This error was introduced by applicants’ amendment.

A comma should be inserted after the third occurrence of group in line 3 of claim 9.

Claim 15 recites “A, A’, B and B’ are independently non-substituted, or have a substituent...”. However, since claim 15 depends from claim 1, at least one of A and B is required to have a substituent as set forth in claim 1.

11. Applicant is advised that should claim 21 be found allowable, claim 36 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Art Unit: 1774

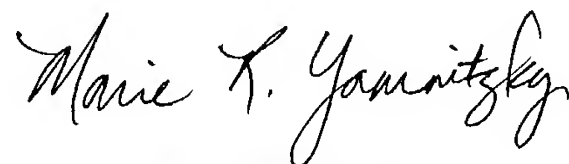
12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for Art Unit 1774 is (703) 872-9306 for all official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
March 19, 2004



MARIE YAMNITZKY
PRIMARY EXAMINER

1774